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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/857,936	08/27/2001	Stephen Peter Najda	YAMAP0766US	2922

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EXAMINER

FLORES RUIZ, DELMA R

ART UNIT	PAPER NUMBER
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2828

DATE MAILED: 12/27/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/857,936

Applicant(s)

NAJDA, STEPHEN PETER

Examiner

Delma R. Flores Ruiz

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Abstract

The abstract which appears on the page of the PCT Stephen Peter Najda [or on the front page of the pamphlet] of published international application number WO 00/36719 will be used as the abstract for this application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 – 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Seko et al (5,425,041).

Regarding claims 1 and 2, Seko discloses an optical semiconductor device comprising an active region (see Fig. 6(a) Character 6), and a p-doped cladding region (see Fig. 6(a), Character 8) disposed on one side of the active region; wherein an

electron reflecting barrier (see Fig. 6(a) Character 7) is provided on the p-side of the active region for reflecting both Γ -electrons and X-electron, the electron-reflecting barrier providing a greater potential barrier to Γ -electrons than the p-doped cladding region (see Figs. 1, 6 (a and b), 7 and 10, Abstract, Column 1, lines 33 – 46, 61 – 67, Column 2, lines 13 – 25, 29 – 57, Column 3, lines 3 – 65, Column 4, lines 5 – 47, 61 – 67, Column 5, lines 1 – 2, 15 – 50, 66 – 67, Column 6, lines 1 – 13, Column 7, lines 1 – 33, 52 – 67, Column 8, lines 1 – 65, Column 9, lines 22 – 25).

Regarding claims 3 and 4, Seko discloses a electron-reflecting layers s a strained layer and electron reflecting layers is in a state of compressive strain and the other of the electron reflecting layers is in a state of tensile strain (Column 3, lines 50 – 54).

Regarding claim 5 and 6, Seko discloses a device is a light emitting diode and the device is a laser device (See Fig. 6(a) Abstract).

Regarding claim 7, Seko discloses a device is separate confinement heterostructure laser device comprising an optical guiding region (see Fig. 6(a) Character 5, Column 7, lines 65 – 67, Column 8, lines 1 – 4) and the active region (see Fig. 6(a), Character 6) being disposed within the optical guiding region.

Regarding claim 8, Seko discloses a layer for reflecting Γ -electrons is disposed between the optical guiding region and the layer for reflecting x-electrons (see Figs. 6(a), and 10).

Regarding claim 9, Seki discloses a Γ -conduction band of the optical guiding region is substantially degenerate with the x-conduction band of the layer for reflecting Γ -electrons (see Figs. 1, 6 (a and b), 7 and 10, Abstract, Column 1, lines 33 – 46, 61 – 67, Column 2, lines 13 – 25, 29 – 57, Column 3, lines 3 – 65, Column 4, lines 5 – 47, 61 – 67, Column 5, lines 1 – 2 , 15 – 50, 66 – 67, Column 6, lines 1 – 13).

Regarding claim 10, Seko discloses a layer for reflecting Γ -electrons is disposed between the layer for reflecting X-electrons and the p-doped cladding region (see Figs. 6 (a), and 10).

Regarding claim 11, Seko discloses the electron-reflecting barrier comprises a plurality of first electron-reflecting layers for reflecting Γ -electrons and a plurality of second-reflecting layers for reflecting X-electrons (see Figs. 1, 6 (a and b), 7 and 10, Abstract, Column 1, lines 33 – 46, 61 – 67, Column 2, lines 13 – 25, 29 – 57, Column 3, lines 3 – 65, Column 4, lines 5 – 47, 61 – 67, Column 5, lines 1 – 2 , 15 – 50, 66 – 67, Column 6, lines 1 – 13).

Regarding claims 12 – 14, Seko discloses the electron-reflecting barrier si superlattice structure (Column 1, lines 32 – 46), the device is fabricated in the (Al, Ga, In)P system, the layer for reflecting Γ -electrons is made from material selected from the group consisting of AlP and GaP, and the layer for reflecting X-electrons is made from InP. (Column 2, lines 29 – 35, Column 3, lines 48 – 67, Column 4, lines 1 – 33 and Column 8, lines 5 – 48).

Regarding claims 15 and 21, Seko discloses the layer for reflecting Γ -electrons is AlP and the optical guiding region is $(\text{Al}_{0.3}\text{Ga}_{0.7})_{0.52}\text{In}_{0.48}\text{P}$ (Column 6, lines 1 – 14 and Column 7, lines 1 – 33).

Regarding claim 16, Seko discloses the thickness of each of the electron-reflecting layers is 16Å or less (Column 5, lines 48 – 51).

Regarding claims 17, 18, and 22, Seko discloses the electron-reflecting layer is p-doped and contains indium (Column 2, lines 30 – 36 and Column 7, lines 9 – 11).

Regarding claims 19 and 23, Seko discloses the electron-reflecting barrier is disposed between the optical guiding region and the p-doped cladding region (see Fig. 6(a)).

Regarding claims 20 and 24, Seko discloses an optical semiconductor device comprising an optical guiding region (see Fig. 6(a) Character 5); an active region (see Fig. 6(a), Character 6) having at least one energy well, said active region being disposed in said optical guiding region; and n-doped (see Fig. 6(a) Character 4) and p-doped cladding region (see Fig. 6(a) Character 8) disposed on opposite sides of the optical guiding region; wherein an electron-reflecting layer for reflecting Γ -electrons is provided at the p-side of the active region; and wherein the Γ - conduction band of the optical guiding region is substantially degenerate with the x-condition band of the electron-reflecting layer and the device is a separate confinement heterostructure laser device (see Figs. 1, 6 (a and b), 7 and 10, Abstract, Column 1, lines 33 – 46, 61 – 67, Column 2, lines 13 – 25, 29 – 57, Column 3, lines 3 – 65, Column 4, lines 5 – 47, 61 – 67, Column 5, lines 1 – 2 , 15 – 50, 66 – 67, Column 6, lines 1 – 13, Column 7, lines 1 – 33, 52 – 67, Column 8, lines 1 – 65, Column 9, lines 22 – 25).

Regarding claim 25, Seko discloses a optical semiconductor device comprising an active region (see Fig. 6(a), Character 6); and a p-doped cladding region (see Fig. 6(a), Character 8) disposed on one side of the active region, wherein at least one electron-reflecting layer is provided on a p-side to the active region of reflecting Γ -electrons (see Figs. 1, 6 (a and b), 7 and 10, Abstract, Column 1, lines 33 – 46, 61 – 67, Column 2, lines 13 – 25, 29 – 57, Column 3, lines 3 – 65, Column 4, lines 5 – 47, 61 –

67, Column 5, lines 1 – 2 , 15 – 50, 66 – 67, Column 6, lines 1 – 13, Column 7, lines 1 – 33, 52 – 67, Column 8, lines 1 – 65, Column 9, lines 22 – 25).

Regarding claim 26, Seko discloses a electron-reflecting layer is fabricated in a phosphorus system (Column 7, lines 9 – 33).

Regarding claim 27, Seko discloses a electron-reflecting layer is provided on the p-side of the active region for reflecting both Γ -electrons and X-electrons, the at least one electrons-reflecting layer providing an greater potential barrier to Γ -electrons than the p-doped cladding region (see Figs. 1, 7 and 10).


Regarding claim 28, Seko discloses a device comprising a active region (see Fig. 6(a), Character 6) has at least one potential well, and is disposed in an optical guiding region (see Fig. 6(a) Character 5), n-doped and p-doped cladding region (see Fig. 6(a) Characters 4 and 8) are deposited on opposite sides of the optical guiding region and the Γ -conductions band of the optical guiding region is substantially degenerate with the X-conduction band of the at least on electron-reflecting layer (see Figs. 1, 6 (a and b), 7 and 10, Abstract, Column 1, lines 33 – 46, 61 – 67, Column 2, lines 13 – 25, 29 – 57, Column 3, lines 3 – 65, Column 4, lines 5 – 47, 61 – 67, Column 5, lines 1 – 2 , 15 – 50, 66 – 67, Column 6, lines 1 – 13, Column 7, lines 1 – 33, 52 – 67, Column 8, lines 1 – 65, Column 9, lines 22 – 25).


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Delma R. Flores Ruiz whose telephone number is (703) 308-6238. The examiner can normally be reached on M - F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-3431.


Delma R. Flores Ruiz
Examiner
Art Unit 2828


QUYEN LEUNG
PRIMARY EXAMINER
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DRFR/PI
December 19, 2002